

THE CLAIMS DEFINING THE INVENTION ARE:

1. A hand tool comprising:

a body, the body containing a brushless DC motor, and

motor control means which controls energisation of the motor,

5 wherein said brushless DC motor is electrically supplied to drive a power output means connected to said motor.
2. A hand tool comprising:

a body,

a motor contained within the body,

10 a void space between an internal surface of the body and at least a part of the motor,

a fluid inlet port provided in or on the body,

a fluid outlet port provided in or on the body, and

ducting means which provides a channel for fluid supplied via the fluid inlet

15 port to and from the void space and then on to the fluid outlet port.
3. A hand tool as claimed in claim 2, wherein the motor is a brushless DC motor which is sealed within a motor housing, the void space existing between the internal surface of the body and at least a part of the motor housing.
4. A hand tool as claimed in claims 2 or claim 3, wherein said hand tool includes

20 a power output means connected to the motor.
5. A hand tool as claimed in any one of claims 2 to 4, wherein said hand tool includes a motor control means which controls energisation of the motor.
6. A hand tool as claimed in any one of claims 3 to 5, wherein the motor housing

and body are both substantially cylindrical in shape and are aligned coaxially with the void space existing over substantially all of the radially extending region between the motor housing and body.

7. A hand tool as claimed in any of one claims 2 to 6, wherein the fluid supplied
5 to the void space provides cooling to the motor.

8. A hand tool as claimed in any of one claims 2 to 7, wherein the fluid supplied to the void space is a compressed pneumatic fluid.

9. A hand tool as claimed in any one of claims 2 to 8, wherein the fluid supplied to the void space is at a pressure greater than the external environment pressure.

10. A hand tool as claimed in any one of claims 3 to 9, wherein the ducting
10 means causes the fluid supplied to the fluid inlet port to, within the void space, first travel in a direction parallel to the axis of the body and motor housing and then to travel about the axis before again travelling along the axis to the fluid outlet port.

11. A hand tool as claimed in any one of claims 2 to 10, wherein the fluid
15 supplied to the void space maintains the motor temperature between about 35°C to about 50°C, and/or maintains the external temperature of the body between about 25°C to about 40°C.

12. A hand tool as claimed in any one of claims 2 to 11, wherein the fluid
supplied to the void space is provided at between about 15 L/min to about 35L/min,
20 at between about 1.5 Bar to about 3.0 Bar, and at between about 8°C to about 22°C.

13. A hand tool as claimed in any one of claims 2 to 12, wherein fluid is supplied to the void space only when the motor is operational.

14. A hand tool as claimed in any one of claims 3 to 13, wherein the motor housing and body are both substantially cylindrical in shape and are aligned coaxially

with the void space existing over substantially all of the radially extending region between the motor housing and body.

15. A hand tool as claimed in any one of claims 2 to 14, wherein the body is adapted to connect to a supply conduit via a quick release fitting.
- 5 16. A hand tool as claimed in claim 15, wherein the supply conduit provides electrical power to the motor as well as said fluid supply to said fluid inlet port and a path to allow fluid to flow from said fluid outlet port.
17. A hand tool as claimed in claim 15 or claim 16, wherein fluid is supplied to the void space when the supply conduit is connected to the body.
- 10 18. A hand tool as claimed in claim 1, wherein the body is adapted to connect to a supply conduit via a quick-release fitting.
19. A hand tool as claimed in claim 18, wherein the supply conduit provides electrical power to the motor.
20. A hand tool as claimed in claim 1 or any one of claims 4 to 19, wherein the
15 power output means is a shaft capable of providing a driving force to a connected implement.
21. A hand tool as claimed in claim 20, wherein the implement may be an implement selected from one of the following types: a rotatable circular blade, a reciprocating blade, a pair of connected reciprocating blades, a rotating drum past a
20 blade, a universal connection means able to attach or fit or house a tool.
22. A hand tool as claimed in claim 1 or any one of claims 4 to 21, wherein the power output means comprises a rotating shaft, a toothed wheel or cog, disc or other suitable gear head.

23. A hand tool as claimed in any one of claims 4 to 22, wherein the power output means includes a gearing system able to translate the power output by the shaft to a pre-determined speed or torque.
24. A hand tool as claimed in any one of the preceding claims, wherein said hand
5 tool includes a rotor position sensing means which outputs a signal which enables the position of the motor's rotor to be determined.
25. A hand tool as claimed in claim 24, wherein the rotor position sensing means comprises a Hall effect sensor.
26. A hand tool as claimed in claim 24, wherein energisation of the motor is
10 determined at least in part on the basis of the rotor position signal.
27. A hand tool as claimed in claim 1 or any one of claims 5 to 26, wherein the motor control means receives manual speed demand input and varies the output speed and/or torque of said brushless DC motor accordingly.
28. A hand tool as claimed in claim 1, wherein the body is adapted to connect to
15 a supply conduit via a quick release fitting.
29. A hand tool as claimed in claim 28, wherein the supply conduit provides electrical power to the motor.
30. A hand tool as claimed in any one of the preceding claims, wherein a power switch handle is used to activate the hand tool.
- 20 31. A hand tool as claimed in any one of the preceding claims, wherein activation is achieved by pushing a base of a plunger on the handle forward against a biasing force and enabling activation of a sensing switch.
32. A hand tool as claimed in any one of the preceding claims, wherein activation

- of the switch may be via movement of a bevelled surface of the plunger against the switch and then by holding the handle down flush with the hand tool body.
33. A hand tool as claimed in any one of the preceding claims, wherein a switch is provided for switching electrical supply to said brushless DC motor on and/or off.
- 5 34. A hand tool as claimed in claim 33, wherein said switch is a non-contact magnetic reed switch located within the body which is sealed.
35. A hand tool as claimed in any one of the preceding claims, wherein the hand tool includes a power input means adapted to be supplied with an input DC voltage via a connectable power cable.
- 10 36. A hand tool as claimed in claim 35, wherein the power input means comprises a quick-release plug or socket type arrangement.
37. A hand tool as claimed in any one of the preceding claims, wherein the hand tool includes heat dissipation and/or insulation means.
38. A hand tool as claimed in claim 37, wherein the heat dissipation means are
15 cooling fins.
39. A hand tool as claimed in claim 37 or claim 38, wherein the insulation means substantially surrounds heat generating hand tool components and substantially reduces heat transfer from said hand tool body from transferring heat to an operator.
40. A hand tool as claimed in any one of the preceding claims, wherein the hand
20 tool is constructed of metal, plastics or composite materials.
41. A hand tool as claimed in any one of the preceding claims, wherein the body is sealed.
42. A hand tool as claimed in any one of the preceding claims, wherein the body

is substantially cylindrical in shape and sized to fit into a user's hand.

43. The use of a hand tool substantially as hereinbefore described, and as claimed in any one of the preceding claims.

44. A hand tool substantially as hereinbefore described and as illustrated with
5 reference to any one of the accompanying drawings.